

AD-A131 633

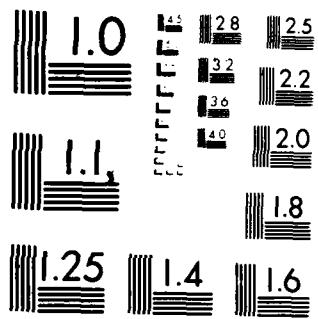
150 HOUR ENGINE TEST OF CORROSION INHIBITED
MIL-L-23699C OIL(U) ARMY TSARCOM DEPOT ENGINEERING
SUPPORT BRANCH CORPUS CHRISTI A.. B G WILSON JUN 83
UNCLASSIFIED MRDP-6297-1

1/1

F/G 11/8

NL

END
DATA FILMED
9-83
DTIC



MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS 1964 A

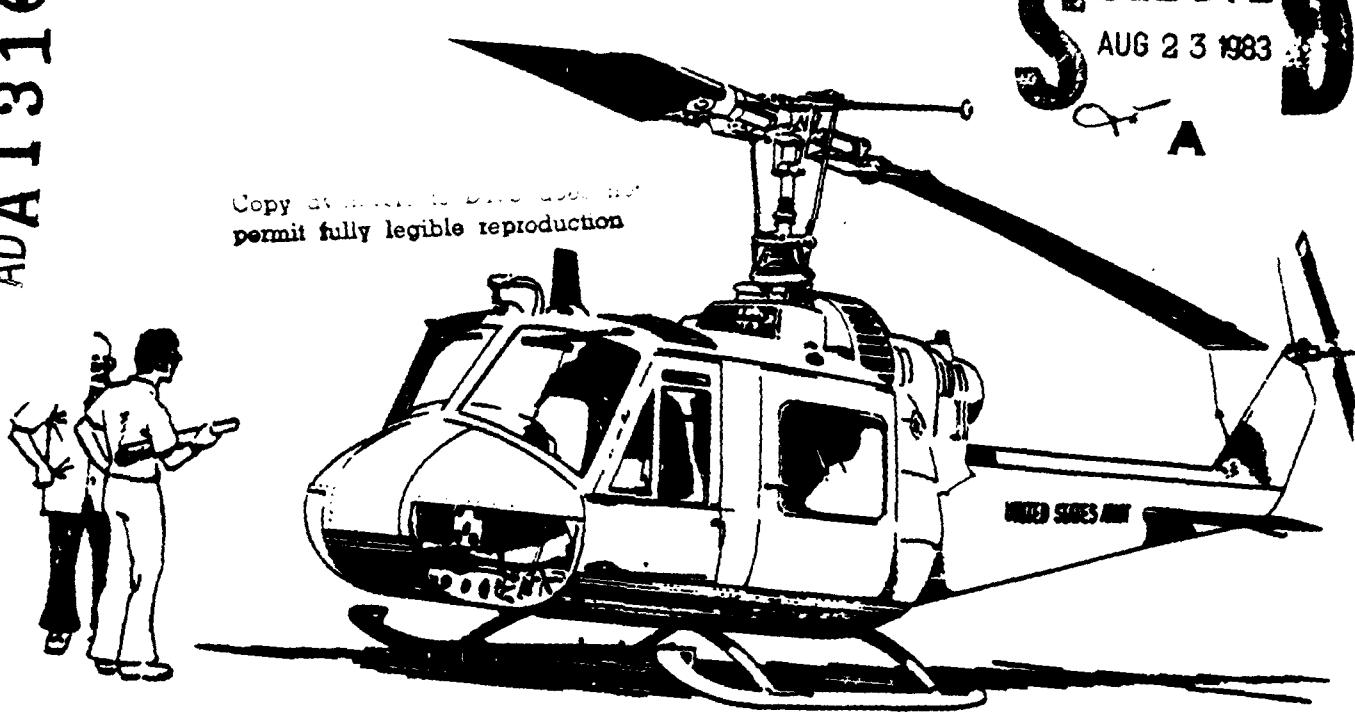


(12)

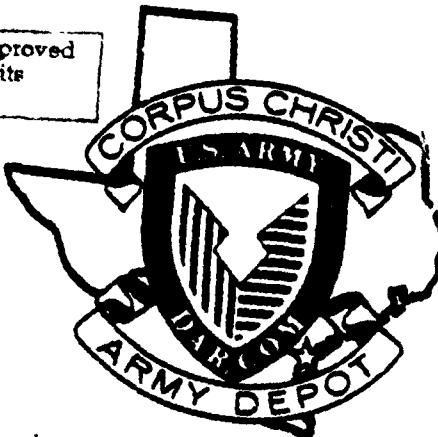
RCM AND DEPOT ENGINEERING SUPPORT DIVISION

ADA 131633

DTIC
ELECTED
S AUG 23 1983



This document has been approved
for public release and sale; its
distribution is unlimited.



DTIC FILE COPY

DEPOT ENGINEERING SUPPORT BRANCH at CCAD

83 08 18 007

DISCLAIMER NOTICE

**THIS DOCUMENT IS BEST QUALITY
PRACTICABLE. THE COPY FURNISHED
TO DTIC CONTAINED A SIGNIFICANT
NUMBER OF PAGES WHICH DO NOT
REPRODUCE LEGIBLY.**

150 HOUR ENGINE
TEST OF CORROSION INHIBITED
MIL-L-23699C OIL

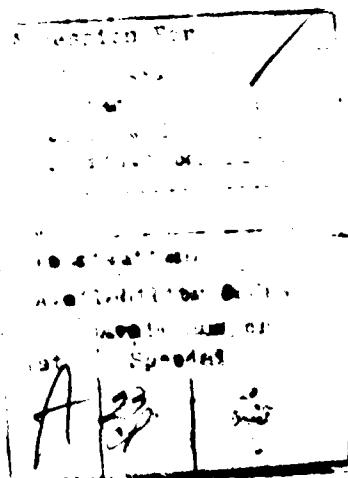
JUNE 1983

TECHNICAL REPORT NR: MRDP-6297-1

WRITTEN BY: Billy G. Wilson

BILLY G. WILSON
Chief, Power Plant & PWTN Sec 2 CCAD

TSARCOM DEPOT ENGINEERING SUPPORT BRANCH
POWER PLANTS SECTION
DRSTS-MRDP
CORPUS CHRISTI ARMY DEPOT
CORPUS CHRISTI, TEXAS 78419



PURPOSE:

To provide results of engine test on a modified version of MIL-L-23699C Oil (MERADCOM is the proponent for this test).

BACKGROUND:

1. This office conducted a 150 hour qualification at CCAD, during the period 16 through 29 January 1981, using a T53-L-13B engine in a CCAD Test Cell.

The primary objectives of the test was to evaluate MIL-L-23699 oil with a corrosion inhibitor additive (prepared by MERADCOM) and to qualify a new vendor source for First and Second Stage Gas Producer Turbine Blades. Several repairs to parts were also being evaluated. This report will address the test oil only.

2. The CCAD Test Cell Lubrication System is massive in comparison to an aircraft Lubrication System such a system could not produce realistic test results. A simulated aircraft lubrication system was designed, fabricated, and used to recently engine test an on-line ferrograph analyzer. This system was patterned after the UH-1H aircraft, having the same oil capacity and using the same oil cooler and oil tank. See Appendix A for further details. The simulated aircraft lubrication system was used during the 150 hour qualification test. See Appendix A.

TEST PLAN:

1. The 150 hour qualification test was conducted in accordance with Lycoming Test Specification XT5313.4c with the following changes:

a. Power setting were established where possible from TIT maximum limit rather than SFC.

b. Seven oil samples were taken during each six hour cycle of test and submitted to the laboratory for analysis.

c. The cycle time was changed to permit two shift operation without the two hour cool down time.

d. The engine testing was conducted manually as the test sequences required are not in the computer program. Only the initial calibration run at the beginning of the test and at the conclusion were computer runs. See Appendix B and C.

2. The Lycoming test specification is not included in the report but is available. It specifies engine loads and times to be run at each power setting. The test is more severe than would normally be experienced during aircraft operation. The PEI provides special instructions for CCAD during engine assembly, test and disassembly. See Appendix B.

TEST AND OBSERVATIONS:

1. The initial calibration of the engine indicated it would produce rated power at 99.07 NI speed and 1075°F MGT at standard day seal level condition which is average. Oil temperatures from the #2 and #3 bearing packages were normal. Oil consumption for the calibration run was zero. See Appendix C.
2. The first cycle of the test was run with no unusual problems. The engine at maximum power developed 1437 horsepower with a 48°F ambient. The bearing oil out temperatures were: #2 bearing package 354°F, #3 bearing package 331°F. These temperatures were obtained using the aircraft duplicated oil system. This system also uses bleed air from the engine to run the oil cooler blower fan.
3. The 150 hours of testing was performed with no unusual problems. There was no noticeable oil consumption, make up oil was added for that removed for laboratory testing. The engine vibration was normal and did not change during the test. Bearing oil temperatures during testing did not significantly increase.
4. The engine performance after completion of the 150 hour test had decreased slightly; it produced normal rated power with an NI speed of 99.7% and 1110°F MGT. This is well within normal degradation as the compressor picks up some oil and dust during operation which decreases compressor efficiency. See Appendix E.
5. Seven (7) oil samples were taken each six (6) hour cycle. These were carried to the laboratory and a spectrographic analysis run on each sample. There were no significant increases of any metals during the test. The results were discussed with the laboratory personnel. See Appendix F for an example.
6. A one quart sample was taken after 75 hours of the test was completed and also after 150 hours. These samples were sent to the laboratory with a request for foaming characteristics test per ASTM-D-892-72. The results are given in Appendix G.
7. The engine was disassembled after completion of the test and all parts laid out for inspection. Personnel from MERADCOM visited CCAD and inspected the gears, bearings and seals. All gears and bearings were in good condition with no unusual discoloration or wear. The seals did not indicate any abnormal wear or leakage. The number one seal which is the most likely to leak during test indicated no leakage and only a minor amount of coking.

ANALYSIS:

1. Tests showed no adverse affects in using this modified version of MIL-L-23699C, observations during test and after engine disassembly, indicated this modified oil functioned (cleaned, cooled, and lubricated) as good as the standard MIL-L-23699C oil. There was no unusual coking of seals or wear on gears or bearings.

2. This test did not address corrosion resistance. A comparative corrosion resistance test of the modified vs. standard MIL-L-23699 oils will be (or has been) conducted by MERADCOM. If further testing of the long range effects of this modified oil is desired, suggest Mr. Bill Masters, TSARCOM, be contacted at AV 693-3041. Mr. Masters can have the oil tested in aircraft at the best board (Fort Rucker, AL). This would provide the quickest method of extended service testing the modified oil.

APPENDIX A

Duplication of UH-1H aircraft lubrication system in CCAD test cell.

1. The test cell lubrication system has a much greater quantity of oil than an aircraft lubrication system and has additional filtration. It also has temperature control for both heating and cooling to maintain a constant oil temperature. To realistically test the characteristics of the modified MIL-L-23699C oil, it was decided to use a system developed for a previous project which duplicates the aircraft oil system. This system was designed and used during a ferrograph analyzer test.
2. The design of a portable lubrication system that duplicates the UH-1H aircraft system, in both function and oil capacity (three gallons), was built. Figure 1 is a drawing of test cell installation; Figures 2 and 3 are photographs of test cell with engine installed; Figure 4 is the control room.

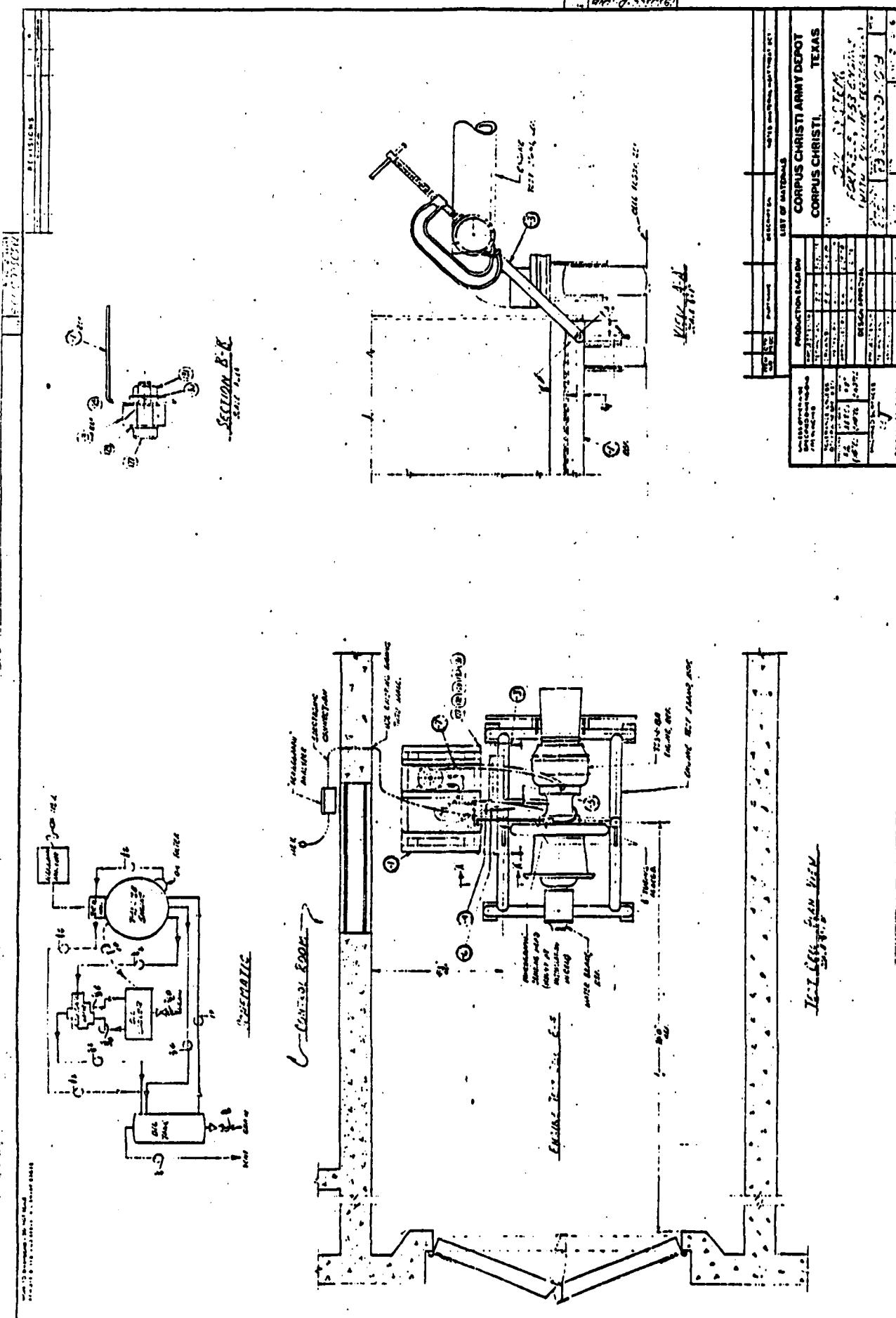
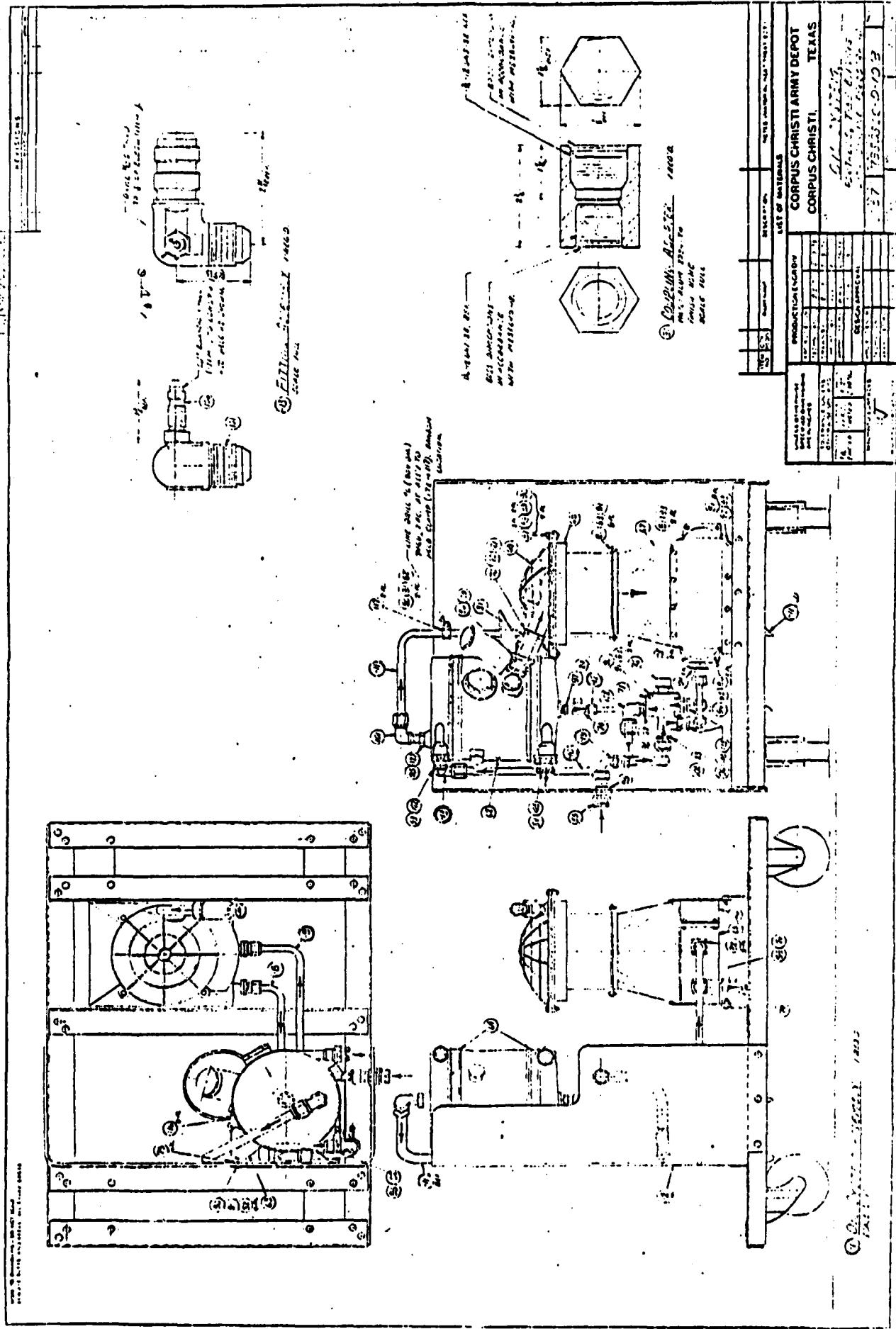


FIGURE A



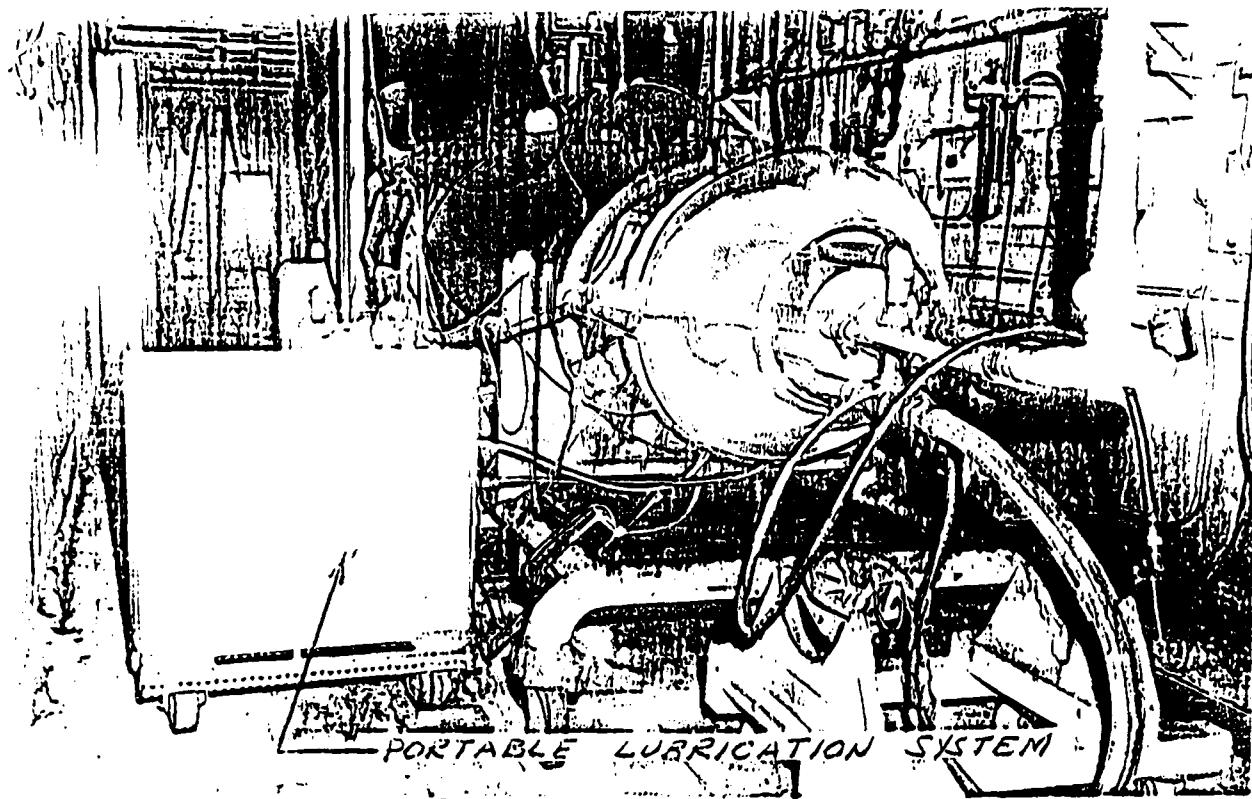


FIGURE A-2

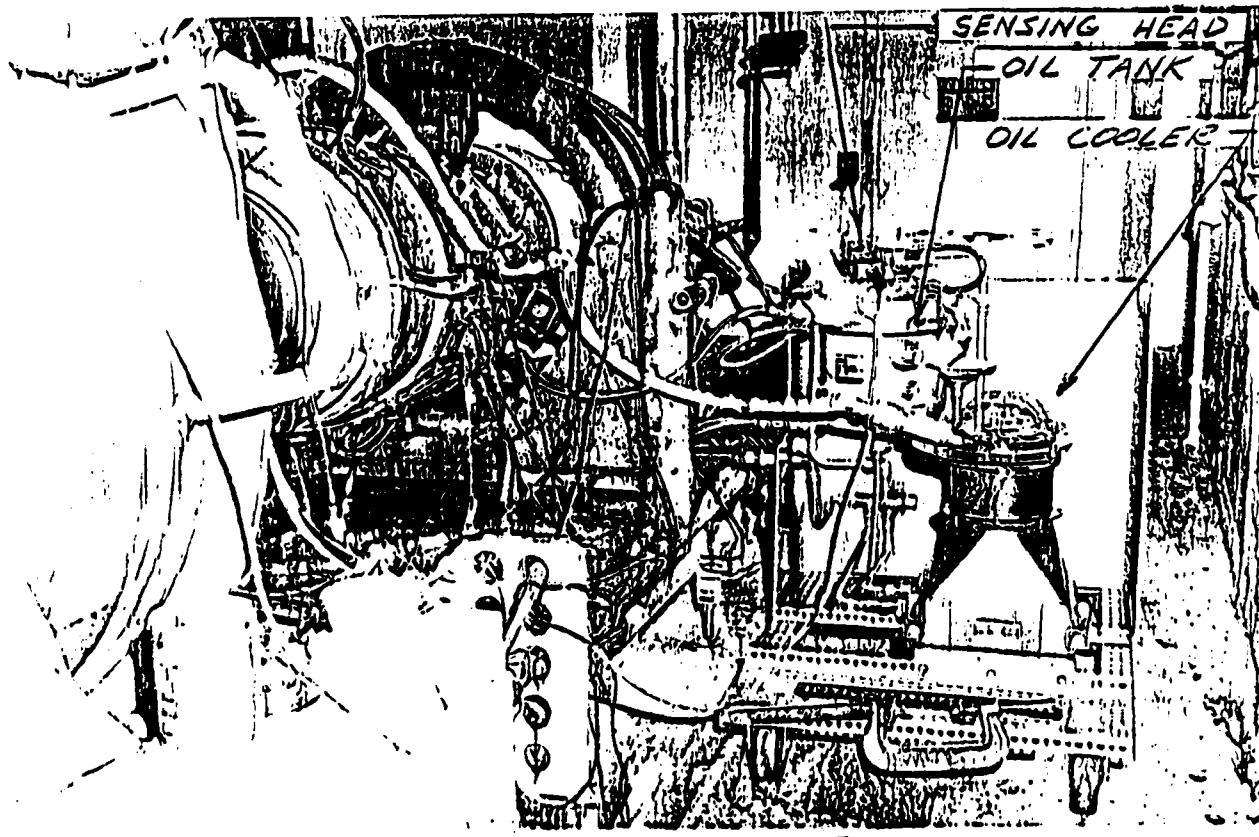


FIGURE A-3

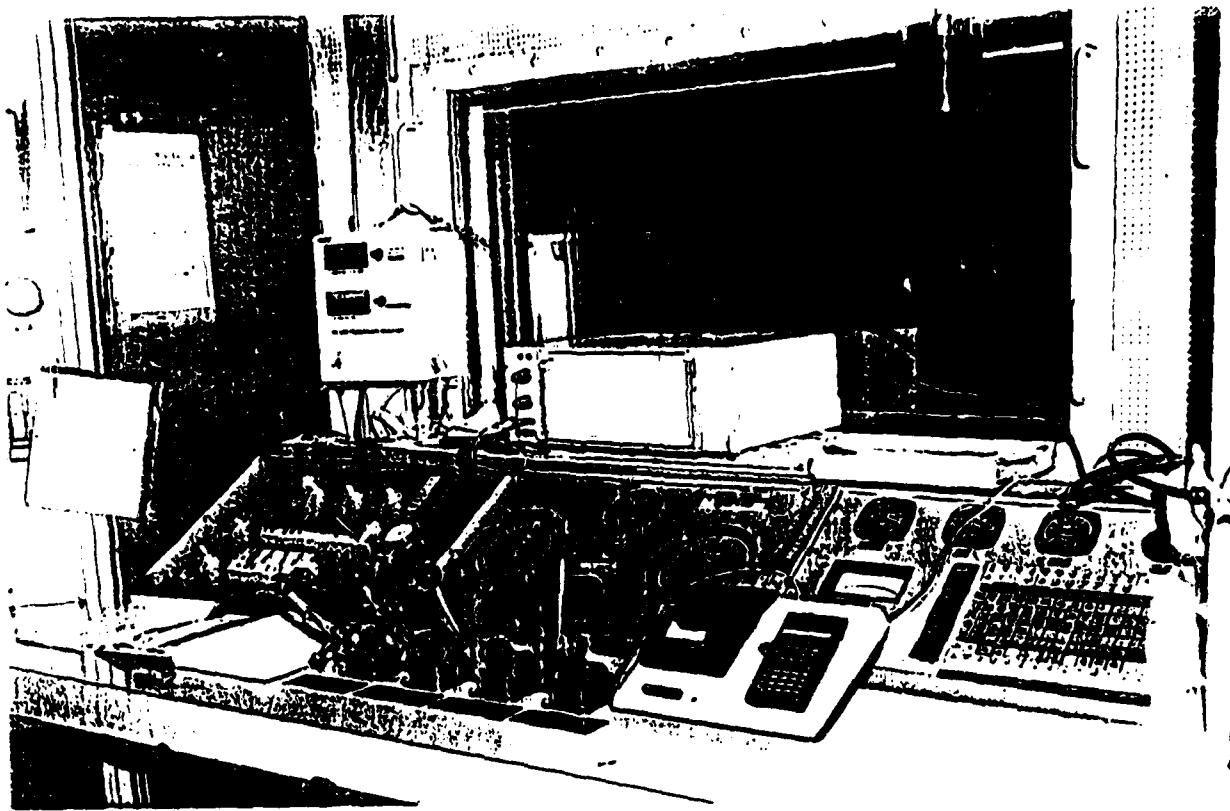


FIGURE A-4

APPENDIX B

PROJECT ENGINEERING INSTRUCTION		FILE CODE T53-T	PEI NR. . MEEP-6299
PROJECT TITLE Assembly, Qualification Test and Dis- of T53-L13B Engine	PAGE 1 OF 2	DATE 08 Sep 80	
PROJECT TITLE Qualification of Turbine Engine Blades (MEEP-6297)	REASON FOR PROJECT		
BILLY G. WILSON <i>Billy Wilson</i>	OFFICE SYMBOL DRSTS-MEEP	TELE. EXT. 4232/3414	

STATEMENT OF WORK:

1. Assemble and test T53-L13B engine S/N K-117 per following instructions using the simulated oil system developed in project MEEP-5477.
2. The oil system will be disassembled and all parts cleaned and flushed.
3. Reassemble oil system and cap all lines.
4. Disassemble test engine as required to replace all main shaft seals and install the test parts listed below:
 - a. Steel impeller housing P/N 1-101-370-03.
 - b. 1st stage sealing disc P/N 1-100-135-03.
 - c. 1st and 2nd stage gas producer turbine blades.
5. First and second stage gas producer turbine wheels will have half test blades and half new blades from supply. Blades will be weighed and paired such that the test blades and the new blades are alternately placed in each turbine disc.

NOTE

If test blades do not have any special markings for identification they will be identified using a vibropeen marker. An "A" will be marked on the forward face of the root area.

6. A 150 hour qualification test will be conducted in accordance with Lycoming Specification XTS 313.4.1C with the following special instructions:
 - a. Power settings will be established where possible from TIT maximum limit rather than SFC.
 - b. Oil sample will be submitted to the laboratory at the end of each work shift. (Approximately six (6) hours of engine operation). Samples will be numbered and records maintained to show operation time at each sample. Laboratory will provide spectrographic report on each sample and overall analysis at the end of test.

7. Two quarts of oil will be taken from lubrication system, immediately upon completion of test, and prepared for shipment.
8. Test engine will be disassembled to allow evaluation of main shaft seals and turbine blades.
9. Test blades (as received from manufacture) will be dimensionally and metallurgically checked by the laboratory. A report is required. Further laboratory assistance will be required to evaluate the tested blades.



WILLETT H. HAGGERTY

Chief, TSARCOM Engr Spt Br @ CCAD

KIN: 1026J360242

GAS TURBINE ENGINE TEST LOG SHEET I

PRINTED 04/06/81 19 25 54 Page: 1 Of 2

TEST ACTIVITY	SER. NO.	SPLITST	STAND NO.	04	PRE-OP	81016	OPERATORS	GARCIA, E.	START TIME
	SEQ. NO.	0322 1999	TEST NUMBER	1	REJECT ID	81016	CONTR.	GONZALEZ, C.G.	RUN TIME
	TYPE/MOD.	153-L138	RUN TIME	3 07	INSPECTOR	NUMBER			
PUK SETTING	G1	F1	B/B	752	MFP	MFP			
MODE	N	N	N	N	N	N			
TIME OF DAY	1337	1345	1106	1229		1321			1315
ELAPSED TIME	:15	:12	:05	:06		:12			:31
FLK LVR ANGLE	25	40	60	100		100			100
NI SPEED	51.0	66.6	61.3	93.1		97.2			99.2
N1 SPEED REF				92.5		96.7			98.9
N2 SPEED	27.3	41.5	71.7	86.7		90.3			94.8
LOAD	1090	1670	3446	10956		13160			14360
SHF TARGET 1	49	110		904		1232			1400
SHF ACTUAL	31	67	257	929		1240			1418
SHF REFERRED				902		1219			1396
MGT ACTUAL	698	689	697	976		1046			1043
MGT REFERRED				957		1032			1074
TII ACTUAL				1511		1660			1724
TII REFERRED				1538		1640			1712
COPR IN TEMP	44	44	44	49		64			62
COPR OUT TEMP	190	269	355	466		64			62
OIL IN TEMP	190	192	196	196		197			196
OIL OUT TEMP	190	192	194	194		195			197
OIL TEMP DIFF				206		224			234
O2 FLOW TEMP	234	246	267	337		343			356
O3 TURB. ITM	231	243	267	314		314			314
FUEL IN TEMP	65	65	65	65		65			65
TURB IN TEMP	51.3	67	15.5	50.9		60.3			63.5
GEARBOX PRESS	1	1	3	7		8			9
OIL IN PRESS	3.0	3.0	2.7	2.6		2.6			2.6
OIL SLAV PRES	32.0	51.0	55.0	56.0		57.0			58.0
FLTK OUT PRES	43.0	65.0	70.0	87.0		88.0			89.0
TURB BOOST	123	126	143	131		134			135
FUEL IN PRESS	34	34	29	34		32			32
FUEL PUMP #1	265	325	355	400		462			508
FUEL PUMP #2	265	325	355	400		462			508
FUEL MAIN PRES	11	25	65	215		305			365
BALLOONER	36.30	36.30	36.30	36.30		30.30			30.30
BURNER PRESS	22	41	76	145		169			179
B/D DELTA PRESS	1.2	2.1	3.9	10.3		12.4			13.4
FUEL FLOW KEF	138	203	355	619		749			820
FAG FFLW. FLOW				607		736			807
OIL FLOW	2165	2710	3070	3195		3190			3205
VIBRATION #1	.20	.20	.40	.30		.20			.20
VIBRATION #2	.30	.50	1.00	.40		.30			.40
VIBRATION #3	.40	.60	1.20	.70		2.10			2.20
VIBRATION #4	.20	.20	.30	.30		.30			.30

THIS ENGINE WILL PRODUCE RATED POWER AT 95.0%N1 SPEED, 1075F/57%FC, AND 60.6 PSI TORQUE AT STANDARD DAY SEA LEVEL (CONT.)

ANY QUESTIONS CONCERNING THIS ENGINE LOG SHEET MAY BE DIRECTED TO AUTOMAN 861-2651/3954.

FIN 1026 J3600242

GAS TURBINE ENGINE TEST LOG SHEET

SEQ. NO. 0322-1999 REC NO. 1 0/G S/N 662AM5011 F/C S/N 662AS126
CURVE TECH DATA SET 9 LIMIT TECH DATA SET

10 LIMIT MODIFICATION • H

PRINTED 09/06/81 10:27:59 PAGE 2 OF 2
OIL MIL-L-23699 FULL MIL-J-5624 JP-4
SPECIFIC GRAVITY @ 60° F .749

S/S START STOP START STOP START STOP

MOT 987 687

ET 27.1 65.3 23.0 43.5

TOD 1607 1130 1206 1350

NEED BAND OFFENS AT 2M1 2M11 TEMP WF PH 10D ET

OS GOV STOPS HIGH WF 2M11 LOU WF 2M11 10D ET

ICV CHECKS 2M1 WF TEMP 100.5 508 76.0 1231 :01

A. 79.3 293 66 MECHAN TO OPEN 1214 :05

B. 94.2 650 65 FULLY OPEN

C. 93.6 633 65 BEGIN TO CLOSE

D. 78.6 278 66 FULLY CLOSED

E. 79.3 293 66 BEGINS TO OPEN

ACCEL CHECKS 2M1 SEC EGT

G1 TO 9d.1 7.6 1144

F1 TO 9d.1 3.3 1085

V10 2M1 2M11 V1 V2 V3 V4 10D ET

75.0 75.0 -.30 -.50 -.20 .30 1100 :04

60.0 60.0 -.20 -.50 -.20 .30

65.0 97.3 -.30 -.60 .200 .30

90.0 94.6 -.20 .60 .200 .40

95.0 97.3 -.30 .60 .200 .30

90.0 100.4 -.20 .50 .210 .30

95.0 97.3 -.30 .60 .200 .30

98.6 97.3 -.20 .40 .200 .30

OIL CONSUMPTION .000 PPH

ANTI-SIZING OPERATION 46.0 PSI

ANTI-SIZING CUSTOMER AIR CHECK OK

WAVE-OFF WET WITH 20.5 IN. H2O ON P1 ON

PRV INITIAL SETTING 3.0 PRV FINAL SETTING 3.0

ICV ACTUATOR ADJUSTMENT NONE

ANY QUESTIONS CONCERNING THIS ENGINE LOG SHEET MAY BE DIRECTED TO AUTONOM 661-2651/394.

APPENDIX D - 1

Copy available to DTIC does not
permit fully legible reproduction

APPENDIX D - 2

Copy 1

TEST NO. 111
OFFICE: 701-1551 GEN. ELECT.
1000 CHRISTIAN, TEXAS
TYPE TEST NUMBER

PWM SETTING	61	FA	B/N	75X	NRF	HIF
HOME	H	H	H	H	H	H
TIME OF DAY	1039	1043	1050	1226	1219	1115
ELAPSED TIME	:04	:04	:06	:07	:06	:16
PWM LVK ANGLE	25	40	65	100	100	100
W1 SPEED REF	50.2	66.2	80.7	94.3	96.1	99.9
W2 SPEED	22.2	32.7	55.5	93.4	97.1	99.1
L/D/B	1150	2440	4036	81.0	99.6	94.0
SHP TARGET	40	110	905	10850	12800	14000
SHP ACTUAL	27	83	233	915	1033	1356
SHP REFERRED				905	1290	1371
HG1 AC FRIAL	697	678	670	1051	1161	1353
HG1 REFL KED				1034	1069	1107
TIT AC TUAL				1579	1687	1757
TIT REFERRED				1556	1643	1723
CURV IN TEMP	76	78	73	65	70	67
CURF OUT TEMP	269	289	378	525	552	560
OIL IN TEMP	198	192	196	196	197	193
OIL OUT TEMP	199	199	198	198	192	193
OIL OUT TEMP	192	193	198	198	210	234
S2 MNG TEMP	198	225	270	336	354	366
S3 MNG TEMP	200	219	269	320	326	332
FUEL IN TEMP	65	66	62	65	66	65
THROTTLE POSITION	6.6	12.6	19.6	50.9	59.8	65.5
CLEARQX PRESS	.5	.1	.1	.7	.7	.7
OIL IN PRESS	1.1	2.0	1.2	2.0	1.2	2.0
OIL SCAN PRES	32.8	51.9	55.6	56.6	57.6	58.6
FILT OUT PRES	59.9	74.0	64.0	87.0	88.0	89.0
TURBINE ROOST	119	122	129	133	136	136
FUEL IN PRESS	.33	.33	.32	.32	.31	.32
FUEL PUMP #1	260	325	354	406	466	522
FUEL PUMP #2	260	326	355	406	468	522
FUEL MAN PRES	12	25	56	225	316	363
BAROMETER	39.68	39.68	39.68	39.68	39.68	39.68
BURNER PRESSES	19	39	70	141	162	174
P/M DELTA PRESS						
FUEL FLOW	1.3	2.6	4.4	16.3	12.2	13.2
FUEL FLOW REF	1.36	2.66	3.04	626	746	828
EMC FUEL FLOW				619	728	809
OIL FLOW	2160	2719	3699	3185	3190	3210
VIBRATION #1	.29	.29	.49	.29	.29	.49
VIBRATION #2	.39	.29	.27	.66	.60	.59
VIBRATION #3	.69	.190	1.59	2.99	1.99	1.99
VIBRATION #4	.30	.26	.36	.46	.46	.66

THIS ENGINE WILL PRODUCE RATED POWER AT 99.72N1 SPEED, 111OF/599C MET AND 62.4 PSI TORQUE AT STANDARD DAY SEA LEVEL (100).

ANY QUESTIONS CONCERNING THIS ENGINE LOG SHEET MAY BE DIRECTED TO AUTON 861-2651/3954.

APPENDIX E-1

TRN: 102KJ109342

GAS TURBINE ENGINE TEST DISCREPANCIES

SER. NO. SP157

SER. NO. 0322.1999

RUN NO. 1

RUN DATE 0104

DISCREPANCY

BASIC S/S G1 F1 752 NRP MAX MIL ACC/UNI DGN SWR IGV CUT VIB OSC SPL

UNLISTED DISCREPANCY 207 X

SU 9 Test 81 Oct 16/02 unk power.

PRINTED 09/06/01 10:24:17 PAGE 1 OF 1

E - 2

DATE OF TEST 01046 GAS TURBINE ENGINE PERFORMANCE ANALYSIS

RUN: 102KJ109342

	ZNT	WT	PR	W	TIT	NGT	WA/WF	WA/WH	DT/WA	PB/WA	CORREL
ACTUAL	93.1	61.9	5.79	10.44	153.0	97.4	60.71	6.73	40.61	13.89	.802
936 HP	93.0	221	5.86	16.56	1525	96.5	60.66	6.77	46.17	13.96	.806
STD LIN											
PCT DEV	.53-	1.77	1.61-	2.42-	2.14	1.15	4.26-	2.63-	1.69-	1.16	1.64
ACTUAL	97.2	749	6.56	11.46	1666	1044	55.17	7.69	40.16	14.72	.623
1246 HP	97.0	747	6.56	11.43	1652	1039	55.06	7.67	46.97	14.61	.622
STD LIN											
PCT DEV	.51-	1.66	1.79-	2.69-	1.85	1.76	3.92-	2.35-	.79-	.76	.98
ACTUAL	99.2	820	6.87	11.96	1724	1063	52.59	7.23	38.87	14.68	.625
1460 HP	99.0	809	6.95	11.86	1714	1075	52.86	7.26	40.67	14.96	.628
STD LIN	101.0	612			1659	1099					
PCT DEV	.50-	.67			1.66-	3.16-	2.69-	3.94-	2.57-	2.27-	1.61
	1.000	1.000	.996	.996	.996	.996	1.000	1.000	CORRELATION COEFFICIENTS		

SER. NO. 0322.1999 SER. NO. SP157 CELL NO.-04 RUN NO. 1
GPX .00 GP2X .00 PTX .00 PT2X .00

REQUEST FOR AND RESULTS OF TESTS				PAGE NO	NO OF PAGES
SECTION A - REQUEST FOR TEST					
1. TO: (Include ZIP Code)			2. FROM: (Include ZIP Code) WILMINGTON TEST DIVISION ACI - AUTOMOTIVE SOURCE		
3. CONTRACTOR AND ADDRESS (Include ZIP Code)			4. MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code) WILMINGTON, NC 28401		
5. CONTRACT NUMBER		6. P.O. NUMBER			
7. END ITEM AND/OR PROJECT		8. SAMPLE NUMBER	9. LOT NO	10. REASON FOR SUBMITTAL CHROMATOGRAPHIC OIL ANALYSIS, ROAD REG 750-1	11. DATE SUBMITTED 1/1/81
10. MATERIAL TO BE TESTED	10a. QUANTITY SUBMITTED	11. QUANTITY REPRESENTED	12. SPEC & AMEND AND/OR DRAWING NO & REV FOR SAMPLE & DATE D-5-L-57		
13. PURCHASED FROM OR SOURCE		14. SHIPMENT METHOD	15. DATE SAMPLED AND SUBMITTED BY Dakota 1/1/81		
16. REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS. Sampled at 1/1/81 from lot 1100000 100% sample 100% test					
17. SEND REPORT OF TEST TO WILMINGTON TEST DIVISION, WILMINGTON, NC 28401 TEST CELL DIVISION X4507					
SECTION B - RESULTS OF TEST (Continue on plain white paper if more space is required)					
1. DATE SAMPLE RECEIVED	2. DATE RESULTS REPORTED	3. LAB REPORT NUMBER 81-C669			
4. TEST PERFORMED	RESULTS OF TEST	SAMPLE RESULT	REQUIREMENTS		
DATE	TYPED NAME AND TITLE OF PERSON CONDUCTING TEST		SIGNATURE		

DD FORM 1222
FEB 62

REPLACES DD FORM 1222, 1 JUL 58, WHICH IS OBSOLETE.

REQUEST FOR AND RESULTS OF TESTS

PAGE NO. NO OF PAGE.

SECTION A - REQUEST FOR TEST

1. ORGANIZATION DIVISION PROBOSCOPIC BRANCH		2. FROM: (Include ZIP Code)	
3. CONTRACTOR AND ADDRESS (Include ZIP Code)		D/MAINTENANCE ENGINE DIVISION ENGINE ASSEMBLY BRANCH	
4. CONTRACT NUMBER END ITEM AND OR PROJECT T53 ENGINE PCN-Z94QCS		4. MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code) ENGINE TEST CELL# 4	
5. AFTER 1ST SHUTDOWN 6. AFTER 1ST NRP 7. AFTER 2ND NRP		5. AFTER TRANSIENT CK. 6. AFTER 75% 7. AFTER LAST SHUTDOWN	
8. CONTRACTOR NUMBER END ITEM AND OR PROJECT OIL		9. SAMPLE NUMBER LOT NO SPECTROGRAPHIC OIL ANALYSIS CCAD REG 750-1	
10. MATERIAL TO BE SUBMITTED OIL		11. QUANTITY REPRESENTED 7- BOTTLES	
12. PURCHASED FROM OR SOURCE ENGINE TEST CELLS		13. SHIPMENT METHOD PE-5-L957	
14. DATE SAMPLED AND SUBMITTED BY D. RODRIGUEZ		15. DATE SUBMITTED 26 JAN 81	
16. REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS. ENG(NE SERIAL NUMBER: KXXXX SPECIAL ENGINE ENGINE SEQUENCE : K-117 Cycle #13			
17. SEND REPORT OF TEST TO STOP # TEST CONTROL SECTION 5CC2E 25 TEST CELL OFFICE X-4587 OR 2313			
SECTION B - RESULTS OF TEST (Type or print on plain white paper if more space is required)			
1. DATE SAMPLE RECEIVED	2. DATE RESULT IS RECEIVED	3. LAB REPORT NUMBER	
4. TEST PERFORMED SPECTROGRAPHIC OIL ANALYSIS	RESULTS OF TEST NORMAL	SAMPLE RESULT	REQUIREMENTS
DATE JAN 26, 1981	TYPED NAME AND TITLE OF PERSON CONDUCTING TEST Stephen Tato, Chemist	SIGNATURE Stephen Tato	

DD FORM 1 FEB 62 1222

REPLACES DD FORM 1222, 1 JUL 58, WHICH IS OBSOLETE.

REQUEST FOR AND RESULTS OF TESTS

PAGE NO. NO. OF PAGES

SECTION A - REQUEST FOR TEST

1 TO: (Include ZIP Code)

2 FROM: (Include ZIP Code)

Loyd Int
Englewood Div
Eng Sup Br

3 MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code)

- 1) After Start 2) After Transient
 3) After 1st Run 4) Check
 5) After 1st Shift 6) After 10 hr.
 7) After 24 hr. 8) After Test
 9) Other _____

10 SAMPLE NUMBER

11 ITEM AND/OR PROJECT

12 MATERIAL TESTED

13 QUANTITY SUBMITTED

14 PURCHASED FROM OR SOURCE

15 DATE SAMPLED AND SUBMITTED BY

16 REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS

17 SEND REPORT OF TEST TO

TEST CONTROL SECTION 5C2 STOP 25

TEST CELL OFFICE 44587

SECTION B - RESULTS OF TEST (Continue on plain white paper if more space is required)

18 DATE SAMPLE RECEIVED

19 DATE RESULTS REPORTED

20 LAB REPORT NUMBER

21 TEST PERFORMED

22 RESULTS OF TEST

23 SAMPLE RESULT

24 REQUIREMENTS

SPECTROGRAPHIC ANALYSIS

NORMAL

DATE

TYPED NAME AND TITLE OF PERSON CONDUCTING TEST

SIGNATURE

DD FORM 1222
1 FEB 64

REPLACES DD FORM 1222, 1 JUL 58, WHICH IS OBSOLETE.

1st CYCLE

25 CYCLE

REQUEST FOR AND RESULTS OF TESTS				PAGE NO	NO OF PAGES
SECTION A - REQUEST FOR TEST					
1. TO: (Include ZIP Code) LABORATORY DIVISION MILITARY BRANCH		2. FROM: (Include ZIP Code) ENGINE Supply Branch ASSEMBLY SECTION			
3. CONTRACTOR AND ADDRESS (Include ZIP Code) PCN - Z446.C5		4. MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code) C.C.A.D			
5. CONTRACT NUMBER		6. P.O. NUMBER			
7. END ITEM AND/OR PROJECT T53 ENGINE		8. SAMPLE NUMBER	9. LOT NO	10. REASON FOR SUBMITTAL FOAM TEST	11. DATE SUBMITTED 14 JAN 81
12. MATERIAL TO BE TESTED CIL	13. QUANTITY SUBMITTED 1-GT	14. QUANTITY REPRESENTED	15. SPEC. & AMEND AND/OR DRAWING NO. & REV PE-5-L957	16. DATE SAMPLED AND SUBMITTED BY 29 JAN 81 D Rodriguez	
17. PURCHASED FROM OR SOURCE ENGINE TEST CELL #4					
18. REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS Perform Foam TEST on Sample Provided 75 hours					
19. SEND REPORT OF TEST TO ENG Edn Cn GCGZ #25 STEP TEST CELL OFFICE 2315 X-4557					
SECTION B - RESULTS OF TEST (Continue on plain white paper if more space is required)					
1. DATE SAMPLE RECEIVED 20 Jan 81	2. DATE RESULTS REPORTED	3. LAB REPORT NUMBER 81C0075			
4. TEST PERFORMED	RESULTS OF TEST	SAMPLE RESULT		REQUIREMENTS	
Foaming characteristics of Mil-L-23699C Lubricating Oil ASTM D 892-72					
Test Results			(Foaming Tendency) Foam value in ml, at end of 5 min blowing period Maximum - 5 min.		
Sequence I			5 ml	25 ml	0 ml
Sequence II			8 ml	25 ml	0 ml
Sequence III			5 ml	25 ml	0 ml
DATE 13 Feb 81	TYPED NAME AND TITLE OF PERSON CONDUCTING TEST John B. Bullington		SIGNATURE E. Charles Wilson, C/Chem Br		

DD FORM 1222 FEB 62

REPLACES DD FORM 1222, 1 JUL 58, WHICH IS OBSOLETE.

REQUEST FOR AND RESULTS OF TESTS				PAGE NO.	NUMBER
SECTION A - REQUEST FOR TEST					
TO: (Include ZIP Code)		FROM: (Include ZIP Code)			
EQUIPMENT DIVISION CHEMICAL BRANCH		D/MAINTENANCE ENGINE DIVISION ENGINE SUPPLY BR			
3. CONTRACTOR AND ADDRESS (Include ZIP Code)		4. MANUFACTURING PLANT NAME AND ADDRESS (Include ZIP Code)			
		TEST CELL #4			
CONTRACT NUMBER					
5. END ITEM AND/OR PROJECT		6. SAMPLE NUMBER	7. LOT NO.	8. REASON FOR SUBMITAL	9. DATE SUBMITTED
T53-Engine PCN Z94QC5				Foam Test	1030
10. MATERIAL TO BE TESTED		11. QUANTITY SUBMITTED	12. QUANTITY REPRESENTED	13. SPEC. & AMEND AND/OR DRAWING NO. & REV FOR SAMPLE & DATE	
Oil		1 Qt			
14. PURCHASED FROM OR SOURCE		15. SHIPMENT METHOD	16. DATE SAMPLED AND SUBMITTED BY		
C.C.A.C. ENGINE TEST CELLS			29 Jan 81 D. Rodriguez		
17. REMARKS AND/OR SPECIAL INSTRUCTIONS AND/OR WAIVERS					
Engine S/N - N/A - Special Engine					
Engine SEQ - K117					
(End of 150 Hour Test)					
18. SEND REPORT OF TEST TO					
Test Control Section 5CC2E		Stop #25	Test Cell Office X2313 X4587		
SECTION B - RESULTS OF TEST (Continue on plain white paper if more space is required)					
1. DATE SAMPLE RECEIVED	2. DATE RESULTS REPORTED	3. LAB REPORT NUMBER			
30 Jan 81		81C0080			
4. TEST PERFORMED	RESULTS OF TEST	SAMPLE RESULT		REQUIREMENTS	
Foaming characteristics of Mil-L-23699C Lubricating Oil ASTM D892-72					
Test Results			(Foaming Tendency) (Foam stability)		
Foam value in ml, at end of 5 min. blowing period			Foam value in ml, at the end of 10 min. settling period		
Sequence I 2 ml Maximum - 5 min.			0 ml		
Sequence II 10 ml 25 ml 0 ml			0 ml		
Sequence III 3 ml 25 ml 0 ml			0 ml		
DATE	TYPE NAME AND TITLE OF PERSON CONDUCTING TEST			SIGNATURE	
13 Feb 81	John B. Bullington, Chemist			E. Charles Wilson, C/Chem Br	

DD FORM 1222
1 FEB 62

REPLACES DD FORM 1222, 1 JUL 58, WHICH IS OBSOLETE.

And
END
DATE
FILMED

9 - 83
DTIC